

理学硕士学位 交通与物流

TUM Asia

Technical
University
of Munich

TUM



简介

单学位

由慕尼黑工业大学（TUM）独立授予

18-24个月全日制课程

上课地点：新加坡

实用性知识

实习及论文为必修科目

全球化前景

国际认可的学位（中国教育部承认）

三个专业走向

物流，铁路工程，交通

入学

每年8月份

申请

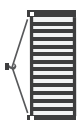
10月15日起开始在线申请，网址为：
www.tum-asia.edu.sg

1 慕尼黑工业大学德国
排名第1⁺

8 慕尼黑工大在全球
就业能力调查中排
名第8[^]

17 慕尼黑工大的17
名成员获得了诺
贝尔奖

50 慕尼黑工大的排
名为世界前50[#]





慕尼黑工业大学

Technical University of Munich (TUM)

慕尼黑工业大学(TUM)是欧洲顶尖的研究型高校之一,目前拥有大约545名教授,10100名教职员,以及超过40000名学生。慕尼黑工大的重点研究领域包括工程科学,自然科学,生命科学和医学。同时,也创立了管理和教育学院。

慕尼黑工大作为创业型大学,一直致力于培养能为社会创造价值的人才。与此同时,在科学和产业领域都有着强实力的合作伙伴。国际化的慕尼黑工大在新加坡设有亚洲校园,并在北京,布鲁塞尔、开罗、孟买和圣保罗都设有办事处。

柴油机之父”鲁道夫·狄塞尔和“制冷机之父”卡尔·冯·林德等诺贝尔奖获得者和发明家都在慕尼黑工大做过研究。在2006年和2012年,慕尼黑工大被评选为“德国精英大学”。在国际排名中也常年位列德国最好的大学之一。

慕尼黑工业大学亚洲

TUM Asia

慕尼黑工业大学坚守为创造更好社会的宗旨,在2002年成立了慕尼黑工业大学亚洲(TUM Asia),是全球第一所德国高校的海外直属分校。凭借慕尼黑工业大学与新加坡国立大学(NUS)、南洋理工大学(NTU)以及新加坡理工大学(SIT)等新加坡顶级高校的合作关系,TUM Asia提供独立开授以及联合开授的本科和硕士课程。

与企业保持紧密的合作关系来确保课程的相关与实用性,德国工程学和亚洲特色的独特组合,使TUM Asia的毕业生有能力进入国际化的企业或科研机构继续发展。拥有超过十年的教育经验,TUM Asia将致力于推出更高质量的教育课程,以满足亚洲工业市场的需求。

至2015年,已有逾1000名学生从TUM Asia毕业,并在全球各行各业的顶尖研究机构和企业继续创造成就。



理学硕士学位

交通与物流



慕尼黑工业大学亚洲 (TUM Asia) 的硕士课程“交通与物流”(理学硕士)旨在提供学生必备的知识和技能,使其能够利用先进的交通和物流技术,实施复杂而深远的解决方案,来应对现代经济中交通方面的挑战。



硕士学位
由德国慕尼黑工业大学独立授予



3-4个学期
全日制,以研究和应用为导向的课程,包括实习和硕士论文



行业导向
我们的教授积极参与研究和教学工作,根据最新的技术趋势和知识来设计课程



全球机遇
你可以选择在慕尼黑、新加坡或世界的任何地方完成实习和论文,以及获得工作机会

科目要求

15

学生必须在2-3个学期内完成15-18门科目

3

三个专业方向可供选择:
物流, 铁路工程, 交通

45

每门必修及选修科目包括45个课时

课程设置: 18 - 24 个月

八月	四个月	六个月*	六个月**	两个月	六个月	毕业
抵达新加坡	· 必修科目	· 必修科目 · 专业科目	· 专业科目 (仅限铁路工程专业)	实习	硕士论文, 在慕尼黑工大、相关企业或研究机构完成硕士论文	学业结束

*学生可以选择去慕尼黑工大学习一学期, 课程计划因此会在实习前增加3个月假期和6个月在慕尼黑工大的学习。如果得到院系许可, 并通过TUM Asia进行登记且完成签证手续, 学生可以选择慕尼黑工大所有院系的科目。详情请邮件咨询: admission@tum-asia.edu.sg

**选择铁路工程专业的学生, 需要在TUM位于慕尼黑的本校校区额外学习一个学期。



Module Overview



Compulsory Modules

Core Modules

- Statistical Methods for Transportation and Logistic Processes
- Traffic Impacts, Evaluation of Transport and Logistic Processes
- Basics of Traffic Flow and Traffic Control
- Transport and Urban Planning
- Highway Design
- Soft Skills (Excursion Practical Experience in Warehouse & Distribution)

Students are required to choose one of the following specialisations:

LOGISTICS

OR

TRANSPORT

OR

RAILWAY ENGINEERING

Core Modules

- Introduction to Business Logistics
- Decision Support for Logistics Management
- Introduction to Supply Chain Management
- Cross-Discipline Modules

*Specialised Modules

(Choose 4 modules from the list below and 1 from Transport's specialised modules)

- Industrial Logistics
- Consumer Industry Supply Chain Management
- Logistics Service Provider (LSP) Management
- Health Care Logistics
- Green Supply Chain and Risk Management
- Design and Application of Material Handling Systems

Core Modules

- Introduction to Business Logistics
- Decision Support for Logistics Management
- Introduction to Supply Chain Management
- Cross-Discipline Modules

*Specialised Modules

(Choose 4 modules from the list below and 1 from Logistics' specialised modules)

- Traffic Operation and Control (ITS)
- Transportation Modelling and Simulation Tools
- Public Transport Planning
- Airport and Harbour Design
- Rail Transport and Rail Planning
- Urban Road Design

Core Modules

- Traffic Operation and Control (ITS)
- Transportation Modelling and Simulation Tools
- Rail Transport and Rail Planning
- Trackworks I
- Trackworks II (Urban Rail Focus)
- Public Transport Planning
- Train Control and Signalling Systems
- Rolling Stock
- Soft Skills

*Specialised Modules

Conducted in Munich**

(Choose 2 to 4 modules from the list below. Each student must accumulate 11 credits)

- Civil Engineering in Energy Technology
- Energy Systems and Energy Economy
- Power Transmission Systems
- Local Public Transport Strategy and Organization
- Geo Information
- Land Use and Transport (Strategies and Models)
- Road Design
- Computer Aided Traffic Engineering with Matlab
- Urban Infrastructure Design
- Strategies in Megacity Regions and Developing Countries

*Disclaimer: Specialization modules available for selection are subject to availability. Unforeseen circumstances that affect the availability of the module include an insufficient number of students taking up the module and/or the unavailability of the professor. TUM Asia reserves the right to cancel or postpone the module under such circumstances.

在TUM Asia 学习：“人才是我们的财富，声誉是我们的回报”

企业家式的思维与行动

TUM Asia拥有一间充满国际化气息，同时又活力四射的校园。我们的课堂体现了国际化 - 我们的学生来自超过28个国家。在这里，学生们不仅仅能够学到书本上的知识，还能够在与来自不同国家以及不同文化背景的同学的交流中有所收获。课堂上大家讨论的想法和观点，常常会涉及多种现实的经济形势，学生们可以从不同的角度去思考分析问题，提高自己用创新性方式解决问题的能力。在这独特的18个月的硕士课程中，学生们不仅仅获得技术和科学方面的知识，还可以通过学习与商业和文化有关的课程来拓展自己。

TUM Create - 电动车研究中心

慕尼黑工大以其在创新方面的研究实力和优势而闻名。正因为如此，在TUM Asia的带领下，慕尼黑工大（TUM）和南洋理工大学（NTU）在新加坡联合创立了研究基地TUM Create。该电动车研究中心汇聚了来自德国和新加坡的专业知识和创新思想，旨在通过推动相关领域的创新研究——小到分子层面，大到城市层面——打造“可持续流动性”交通的未来。TUM Asia的硕士毕业生可以申请在TUM Create读博，尤其是那些对科研和电动汽车感兴趣的同学们。

国际一流水准

在TUM Asia，你可以享受到来自慕尼黑工大和相关行业专家的指导和点拨。学生们不仅可以在积极从事研究工作的教授那里受益，也可以通过参加当地学术界和工业行业的代表举办的讲座而积累全面的学习经验。由慕尼黑工大负责授课的科目，会有慕尼黑工大的教授从德国飞到新加坡专门为TUM Asia的学生授课，确保学生能够完全受到关注。

“慕尼黑工大的交通与物流课程有着多元文化氛围，有助于学生今后在交通与物流行业里走上国际化的职业道路。着重方案设计、话题间互动和创造力的课程可以培养学生领导多学科项目的能力。”

Bernhard Lechner 博士

慕尼黑工业大学高级研究员/讲师，TUM CREATE 研究人员

Module Synopsis

Compulsory Modules For All Specialisations

Core Modules

Statistical Methods for Transportation and Logistic Processes
Transportation science involves analysis of empirical data. The students will learn to apply the most common methods in statistics used to analyse data in practical applications.

Traffic Impacts, Evaluation of Transport and Logistic Processes
This module introduces the basic principles and concepts of an assessment and evaluation of transport and logistic systems. The interrelation between traffic and environment will be discussed.

Basics of Traffic Flow and Traffic Control
This module provides the students with theoretical knowledge of traffic flow. The main topics covered are: traffic stream models, car following and continuum theory for road segments, queuing theory for signalised and unsignalised intersections, etc.

Transport and Urban Planning
The module provides the basic knowledge about transport, mobility and urban planning. The main topics are: travel demand modelling, dependencies between supply and demand, relationships between transport and urban planning, etc.

Highway Design
Planning and design of safe, high efficient and sustainable road infrastructure linking cities needs the knowledge of the dynamic vehicle performance. Driver-Vehicle-Infrastructure interactions rule the geometrical design and the requirements for pavement works. This module also covers the construction and maintenance management of road infrastructure as well as environmental issues, e.g. noise.

Logistics Specialisation

Core Modules

Introduction to Business Logistics
In-depth knowledge about Evolution of Business Logistics, key definitions, megatrends for the future of Logistics, model of logistical activities, logistical objects, cargo transportation, warehousing, operational, tactical and strategic levels of logistical planning, best practices and principles of logistical systems optimisation, future fields of logistics application

Decision Support for Logistics Management
Principles of management decision support, overview on relevant operations research tools and algorithms. Principles of modelling logistical systems (data collection issues).

Introduction to Supply Chain Management
Students are able to interpret and apply: SCM for fully automated processes; transport systems; airport logistics; harbour logistics; courier & express logistics; Third Party logistics; planning methods; design of systems & project management

Cross-Discipline Modules
Selected Topics in Business Management, Aspects of European and Asian Relations Today, Selected Topics in Business Administration

Soft Skills
Business & Technical English, Excursion Practical Experience in Warehouse & Distribution

***Specialised Modules** (Choose 4 modules from the list below and 1 from Transport's specialised modules)

Industrial Logistics
The lecture covers the issues of logistics and supply chain management from the perspective of global industrial producers and suppliers, such as from the electronics, electrical appliances, automotive, machinery industries ("assembly industries").

Consumer Industry Supply Chain Management
This lecture addresses the issues of logistics and supply chain management from the perspective of national and international

consumer goods producers, wholesalers, retail chains and direct marketers, such as from the food and non-food branded goods industries, fashion and luxury goods, home supplies etc.

Logistics Service Provider (LSP) Management
This lecture focuses on the "life cycle" issues of logistics service provider. Management such as market selection and analysis, as well as transport mode choices. Overview of the important LSP markets, such as parcels/express, LTL, truckload, air and seaway forwarding, container shipping, etc.

Health Care Logistics
Aim and scope of this course are the special aspects of logistics and supply chain management in the health care industry. This course offers an introduction to the fundamentals of health care management. Furthermore students learn to understand the basic mechanisms of the health care value chain, develop a sound knowledge of appropriate tools and techniques, management of supply chain, management activities and learn how to evaluate logistic processes in this special field of application.

Green Supply Chain and Risk Management
Students are able to understand the business model of Green Supply Chains and are able to implement green techniques for company short and long term. In addition, students are able to evaluate the threats and for increasing risks in Global and local supply chains. Lastly they can operate risk mitigation and avoidance techniques to deepen their understanding from Supply Chain Management

Design and Application of Material Handling Systems
Material Handling is shown in many business areas and business cases (logistics processes in transport modes like Air traffic, Harbour logistics, Warehouse and Distribution, Express logistics, LSP-business and production logistics). Furthermore an overview about general contractor business and Project Management is given.

Transport Specialisation

Core Modules

Introduction to Business Logistics
In-depth knowledge about Evolution of Business Logistics, key definitions, megatrends for the future of Logistics, model of logistical activities, logistical objects, cargo transportation, warehousing, operational, tactical and strategic levels of logistical planning, best practices and principles of logistical systems optimisation, future fields of logistics application

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Principles of management decision support, overview on relevant operations research tools and algorithms. Principles of modelling logistical systems (data collection issues).

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Cross-Discipline Modules
Selected Topics in Business Management, Aspects of European and Asian Relations Today, Selected Topics in Business Administration

Soft Skills
Business & Technical English, Excursion Practical Experience in Warehouse & Distribution

***Specialised Modules** (Choose 4 modules from the list below and 1 from Logistics' specialised modules)

Traffic Operation and Control (ITS)
The module provides insights into the state-of-the-art control measures for optimising traffic flows. The main topics are: the principles of urban, extra-urban and integrated systems, the objectives, measures, methods and algorithms, systems and technologies used in intelligent transportation systems, etc.

***Disclaimer:** Specialisation modules available for selection are subject to availability. Unforeseen circumstances that affect the availability of the module include an insufficient number of students taking up the module and/or the unavailability of the professor. TUM Asia reserves the right to cancel or postpone the module under such circumstances.
**Students who are specialising in Railway Engineering are required to complete the following modules at TUM's main campus in Munich.

Module Synopsis

Transportation Modelling and Simulation Tools

The module provides detailed knowledge about software tools for traffic and system simulation. Microscopic and macroscopic simulation will be dealt with in this lecture.

Public Transport Planning

The students will learn how to plan and operate different public transport modes. The main topics are: the geometry of transit lines, transit network types and their characteristics, public transport scheduling, transit fares, etc.

Airport and Harbour Design

This module gives an insight into the necessary components of airports and harbours and the planning processes for developing these sites. Besides that it offers several methods for operating airports and harbours.

Rail Transport and Rail Planning

The module covers freight and passenger rail-transport systems focusing on infrastructure planning. The required track alignment tools are introduced based on the kinematic and dynamic features of rail vehicles, the specific train-track interactions, the passenger comfort and the safety requirements. This includes turnouts, junctions and other track configurations for rail network and station design. The students will learn the design, construction and maintenance of rail infrastructure as well as the subsystems and components for conventional and high-speed lines.

Urban Road Design

Provides in-depth knowledge on planning, designing and organizing urban streets as spaces for living, furthermore looking at different ways to organise transportation in an efficient way for various transport modes and mobility needs.

Railway Engineering Specialisation

Core Modules

Rail Transport and Rail Planning

The module covers freight and passenger rail-transport systems focusing on infrastructure planning. The required track alignment tools are introduced based on the kinematic and dynamic features of rail vehicles, the specific train-track interactions, the passenger comfort and the safety requirements. This includes turnouts, junctions and other track configurations for rail network and station design. The students will learn the design, construction and maintenance of rail infrastructure as well as the subsystems and components for conventional and high-speed lines.

Trackworks I

This module provides in-depth knowledge of the forces acting between vehicle and track and of the environmental actions. Students learn the strategies and the tools to design track systems, to analyse and to evaluate track performance with respect to maintenance and safety requirements. Beside track stability, the track quality and track stiffness are of significant importance for high-speed railway lines. Conceptual design of upgraded conventional and ballastless track systems will be discussed too.

Trackworks II (Urban Rail Focus)

This module covers the special features of urban rail systems, especially metro and tram. The specific train-track interactions, track layout and infrastructure design will be discussed. Noise and vibration requirements rule the rail infrastructure and track design in the urban environment. Students will learn the design of floating slab tracks and the application of other measures to minimise the negative effects of urban rail infrastructure. Acceptance and attractiveness of surface rail transport can be enhanced by an integrated infrastructure design (e.g. by green tracks).

Public Transport Planning

The students will learn how to plan and operate different public transport modes. The main topics are: the geometry of transit lines, transit networks types and their characteristics, public transport scheduling, transit fares, etc.

Train Control and Signalling Systems

This module introduces to the students the train control and signalling systems. The benefits and challenges of techniques used will be analysed. Turnout, signals, and all track based equipment, facilities, electronic interlocking and train control systems will be covered too. Risk analysis and assessment of electronic systems and management of train scheduling and transport risk will be discussed.

Rolling Stock

This lecture covers the wheel-rail interaction, running behaviour in curves and straight track, propulsion systems diesel, electricity AC and DC, energy efficiency including regenerative braking, running gear and vehicle construction, including primary and secondary suspension devices, wheelsets, bogie frames and body shells relevant norms and design rules, tendering procedure and homologation process, safety issues as collision safety derailment safety, fire safety, environmental aspects as external and internal noise, particle emission, space consumption, reliability, availability, maintainability, diagnosis systems and their environment and benefit.

Traffic Operation and Control (ITS)

The module provides insights into the state-of-the-art control measures for optimising traffic flows. The main topics are: the principles of urban, extra-urban and integrated systems, the objectives, measures, methods and algorithms, systems and technologies used in intelligent transportation systems, etc.

Transportation Modelling and Simulation Tools

The module provides detailed knowledge about software tools for traffic and system simulation. Microscopic and macroscopic simulation will be dealt with in this lecture

Soft Skills

Cross-cutting fundamentals and methods

Specialised Modules* (Choose 2 to 4 modules from the list below. Each student must accumulate 11 credits)

- Civil Engineering in Energy Technology
- Energy Systems and Energy Economy
- Power Transmission Systems
- Local Public Transport Strategy and Organization
- Geo Information
- Land Use and Transport (Strategies and Models)
- Road Design
- Computer Aided Traffic Engineering with Matlab
- Urban Infrastructure Design
- Strategies in Megacity Regions and Developing Countries

***Disclaimer:** Specialisation modules available for selection are subject to availability. Unforeseen circumstances that affect the availability of the module include an insufficient number of students taking up the module and/or the unavailability of the professor. TUM Asia reserves the right to cancel or postpone the module under such circumstances.

**Students who are specialising in Railway Engineering are required to complete the following modules at TUM's main campus in Munich.

硕士课程申请



申请条件*

土木工程、工程类、经济或相关专业的大四在读生或毕业生可以申请(但不限于此几个专业)。

申请时, 需要提交以下文件:

- 提交一份本科学位证和毕业证(公证件)**
- 提交一份大学期间成绩单(公证件)**
- 提交由不同的教授或上司写的二份推荐信
- 提交一页(A4纸)动机陈述信, 阐述你为何对申请的课程感兴趣
- 提交一份个人简历
- 提交一张护照照片**及护照复印件(有个人资料的护照页)
- 托福或雅思成绩(母语为非英文或本科课程的授课语言为非英文的申请者需要提供)
- APS审核证书(凡毕业于中国、越南和蒙古的申请者需提交APS审核证书)

注意:

申请者的申请学历如果来自中国、越南和蒙古, 需要通过德国驻地大使馆文化处留德人员审核部(简称留德审核部(APS))举办的审核测试, 取得APS证书, 才能够申请德国的大学。

托福成绩要求: 分数不低于605分(Paper-Based test)/ 分数不低于88分(Internet-Based test)

雅思成绩要求: 总成绩不低于6.5分

重要提示: 所有非英文的文件必须由国家依法设立的公证处进行翻译和公证。

备注:

*关于申请流程的具体介绍请登陆官网: www.tum-asia.edu.sg/application-process

**所有通过申请并将入学的申请者需要额外提供二份本科学位证和毕业证公证书, 二份大学四年成绩单公证书和二张护照照片

申请方式

每年10月15日开放在线申请: www.tum-asia.edu.sg

费用

申请费

每个课程:
79新币
(包含消费与服务税)

学费

19,000欧元*

学费包括教学费、考试费、校园网络费和其他教学活动的必要开支。以下费用不包括在内, 应由学生另行支付: 机票、住宿和生活费。学费分为三个学期支付。对于铁路工程专业, 所注明的学费并不包括在德国慕尼黑的额外一学期(六个月)的费用。

*此学费数额为2017年8月1日最新制定。学费的具体数额可能会受汇率变化影响, TUM Asia会酌情修改。以上所列举费用包含新加坡政府征收的7%的消费与服务税。最新学费数额请参照 www.tum-asia.edu.sg/MScfees 公布的信息。



DID YOU KNOW THAT SINGAPORE IS THE PREFERRED LOGISTICS & SUPPLY CHAIN MANAGEMENT HUB FOR LEADING MANUFACTURERS DUE TO EXCELLENT GLOBAL CONNECTIVITY?



东南亚之心：新加坡的战略位置

新加坡在世界十字路口和主要航道上的战略位置，赢得了作为世界重要的物流枢纽和贸易渠道的美誉。新加坡得天独厚的地理位置帮助了物流公司建立了自己的制造业领导地位以及发展高附加值服务。同时，拥有超过178公里的跨岛轨道和连接128个车站的5条新加坡地铁（MRT）以及3条轻轨列车（LRT）。新加坡的交通系统每天运行超过280万趟。此外，新加坡也是领先的航空枢纽，世界级的综合化工中心以及拥有强大的电子产业。因此，新加坡对有效结构和管理的运输和物流系统的需求将持续增长。

新加坡的运输和物流业

新加坡是世界领先的交通和物流枢纽。新加坡连接全球市场的能力、其安全性和亲商进出口程序为企业开展业务提供了更高的效率。新加坡提供一流的基础设施支持物流业的发展，例如位于机场自由贸易区内的新加坡机场物流园（ALPS），便于区域配送的樟宜国际物流园，以及裕廊岛上服务石化企业的邦岩物流园区。

就业前景



我们的交通与物流毕业生在世界各地就职，例如 新加坡（95.2%）、欧洲（4.8%）



职位包括空运分析师、物流分析师、交通分析以及进出口协调员



我们的毕业生预计会在很多企业就职，例如 DHL、Pan Asia Logistics 和 RedMart 等。去年，Pan Asia Logistics 聘请了我们23.8%的毕业生

- 1 2012年世界银行的物流表现指数报告显示，新加坡在全球155个国家中排名第一
- 2 新加坡樟宜机场是亚洲最大的货运机场之一，每年的货物吞吐量接近两百万吨
- 7 新加坡临近全球的主要市场，七个小时的飞行半径覆盖了占有世界人口半数的亚太地区
- 20 新加坡是各大物流公司的首选之地，二十五家跨国物流公司中的二十家都已经在新加坡开展业务
- 31 新加坡是全球最繁忙的转运港之一，其集装箱的转运吞吐量大约占全世界的七分之一；在2012年，达到了3100万个标准箱
- 123 新加坡通过200条海运航线与123个国家的600个港口相连

TUM Asia, 结合了传统教育和亚洲地区最重要的枢纽动力，并为学生提供成功实现梦想和抱负的技术和经验。

Kalin Stoyanov

校友，交通与物流硕士
Planning and Control, Rolls-Royce

有抱负，有动力，开放和敬业是 TUM Asia 的毕业生为 Pan Asia 物流公司的核心价值作出的卓越贡献：知识，诚信，人际关系，以及卓越服务。

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⁺ As rated by Academic Ranking of World Universities (Shanghai Ranking) 2011-2013, 2016 and 2015 QS World University Ranking

[^] As ranked in the 2016 Global Employability Survey by The New York Times

[#] As ranked by Academic Ranking of World Universities (Shanghai Ranking) 2013 and 2013/2014 QS World University Ranking